

SHORT COMMUNICATION

THE MEX.156 SEX-LIMITED LETHAL X CHROMOSOME OF *Drosophila melanogaster*: MOMENT OF ACTION

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ABSTRACT

The present research was performed to determine the moment of action of the Mex.156, female sex-limited lethal, of the X chromosome of the *D. melanogaster*.

INTRODUCTION

Sex-limited effects were first reported in *Drosophila melanogaster* by Kerr and Kerr (1952): homozygote females for an X chromosome and lower viability than hemizygote males with the same X chromosomes.

Two cases of wild X chromosome with lethal effects limited to the female sex in *D. melanogaster* are known (Drescher, 1964; Gallo and Salceda, 1974). Martins and Mourão (1981) have obtained 560 recombinants of wild X chromosomes, one of which with lethal effect, limited to the female sex.

Due to the rarity of such an event, an experiment was performed to find out the moment of action of the Mex.156 chromosome, detected by Gallo and Salceda (1974) in a sample of 179 males from Mexico, DF.

MATERIALS AND METHODS

The strains used were Canton-S (X^+X^+ , X^+Y) and the carrier of the Mex.156

lethal chromosome balanced with the well known Muller 5 strain chromosomes ($X^5 X^1$, $X^5 X^5$, $X^1 Y$, $X^5 Y$).

Two kinds of mass crosses were made: a) $X^+ X^+$ vs. $X^+ Y$, as the control and b) $X^+ X^1$ vs. $X^1 Y$, with F_1 flies from $X^+ X^1$ vs. $X^+ Y$. In each case 20 pairs of flies aged to 4-5 days were put in small population cages (17 x 9 x 9 cm) and allowed to mate and lay eggs during three periods of respectively 16, 8 and 16 hours, in three small Petri dishes (4 cm diameter) per period.

The eggs were counted immediately after removing the Petri dishes from the population cages and again 24 hours later to count the hatched and non-hatched eggs. In sequence, the culture medium of the Petri dishes (15 g of agar, 25 g of saccharose and 1000 ml of water) was transferred to bottles also with culture medium (banana-agar) for the counting of pupae and emerged flies of each sex.

The moment of action of the lethal chromosome could thus be determined as follows: a) at the embryonic stage by the proportion of hatched and non-hatched eggs; b) at the larval stage by the proportion of hatched eggs (= larvae) and pupae; c) at the pupal stage by the proportion of pupae and imagos emerged. Numbers of the control cross were taken as expected to compute equality chi-squares with one degree of freedom.

The experiment was carried out in a constant temperature room of about 25°C.

RESULTS AND CONCLUSION

Table I shows numbers of eggs, larvae, pupae and imagos in control and lethal crosses by oviposition period. Table II gives the viability values computed from Table I.

Egg-larva and pupa-imago viabilities are similar in both crosses ($\chi^2_1 < 3.84$; $P > 0.05$). The larva-pupa viability in the control cross is 7.6% higher than in the lethal cross and such a difference is highly significant ($\chi^2_1 = 28.85$; $P < 0.01$). Consequently a difference of 5.6%, also highly significant ($\chi^2_1 = 11.00$; $P < 0.01$), was observed for the egg-imago viability.

The significant viability differences are due to the death of female larvae in the lethal cross, which produces two significantly different sex-ratios ($\chi^2_1 = 36.79$; $P < 0.01$): 101.28 females per 100 males in the control and 52.28 females per 100 males in the lethal cross. Thus the Mex.156 X chromosome kills the female homo-

Table I - Numbers of eggs, larvae, pupae and imagos in the control and lethal crosses. (H = Hatched, S = Survivors, M = Males, F = Females and T = Total).

Oviposition period	Eggs		Larvae		Pupae		Imagos		
	H	T	S	T	S	T	M	F	T
Control									
16 h	121	154	110	121	105	110	48	57	105
8 h	193	210	176	193	171	176	82	89	171
16 h	231	243	212	231	195	212	104	91	195
Total	545	607	498	545	471	498	234	237	471
Lethal									
16 h	94	98	71	94	62	71	43	19	62
8 h	177	198	154	177	144	154	95	49	144
16 h	198	214	168	198	161	168	103	58	161
Total	469	510	393	469	367	393	241	126	367

Table II - Viability in the control and lethal crosses (χ^2_1 for the difference control minus lethal; ** : $P < 0.01$).

Viability	Cross		Control-Lethal	
	Control	Lethal	%	χ^2_1
Egg-larva	89.8	92.0	+ 2.2	1.97
Larva-pupa	91.4	83.8	- 7.6	28.85**
Pupa-imago	94.6	93.4	- 1.2	1.25
Egg-imago	77.6	72.0	- 5.6	11.00**

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RESUMO

O presente trabalho teve por objetivo estimar o momento de ação do letal Mex.156, limitado ao sexo feminino, do cromossomo X de *Drosophila melanogaster*.

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